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United States Patent [19]

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[54] **MOBILE STATION ASSISTED TIMING SYNCHRONIZATION IN A CDMA COMMUNICATION SYSTEM**

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[52] **U.S. Cl.** **370/335**; 370/503; 370/252; 375/356

[58] **Field of Search** 370/503, 507, 370/508, 509, 516, 350, 335, 519, 328, 342, 441; 375/356, 252; 455/67.6, 442

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[57] **ABSTRACT**

In the present invention, the slave base station attains synchronization with the reference base station through messages transmitted from and received by a mobile station in the soft handoff region between the reference base station and the slave base station. First, the round trip delay between the mobile station and the reference base station is measured by the reference base station. Once the mobile station acquires the signal from the slave base station, it measures and reports the difference between the amount of time it takes a signal to travel from the reference base station to it and the amount of time it takes a signal to travel from the slave base station to it. The last measurement necessary is a measurement by the slave base station of the time difference between the time it received the reverse link signal from the mobile and station the time it transmitted a signal to the mobile station. A series of computations described in detail herein are performed upon the measured time values to determine the time difference between the slave base station and an adjustment of the slave base station timing is performed in accordance therewith.

1 Claim, 9 Drawing Sheets